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Emulating the 1-Dimensional Fermi-Hubbard Model with Superconducting Qubits JAN-MICHAEL REINER, MICHAEL MARTHALER, GERD SCHN, Karlsruhe Institute of Technology — A chain of qubits with both ZZ and XX couplings is described by a Hamiltonian which coincides with the Fermi-Hubbard model in one dimension. The qubit system can thus be used to study the quantum properties of this model. We investigate the specific implementation of such an analog quantum simulator by a chain of tunable Transmon qubits, where the ZZ interaction arises due to an inductive coupling and the XX interaction due to a capacitive coupling.

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